

items that will be queried from the data tables and presented in the daily posting report are the item number, location of where the work is being done, description of the type of work, the actual quantity of that item used for that day, a cumulative total of the quantity used for that month including that day, the total quantity used for the entire project including that day, the percentage complete and unit price. The formula required to calculate the cumulative total of quantity utilized for the month is shown in equation 1. and the calculation used to determine the total quantity used for the project is shown in equation 2. Equation 3 shows the formula needed to calculate the percentage work complete.

(Equation 1) $\text{Quantity_Actual} = \text{Quantity of Item per day}$

(Equation 2) $\text{Cumul_QTY} = \sum(\text{Quantity_Actual's})$

(Equation 3) $\% \text{ Work Compete} = (\text{Plan_QTY} - \text{Cumul_QTY}) / \text{Plan_QTY}$

A print function will be needed in this module to print out the daily posting report in MS Word format in which the necessary data will be inputted into a defined template.

In addition, a daily field journal 116 communicates with the daily field reports module 118. This module will consist of four data tables, which are the daily work progress table, daily equipment table, daily labor force table and submittal table. The user-input fields for the daily work progress table will include the project number, contract number, report date, item number, and actual quantity. The input fields for the daily equipment table will consist of equipment quantity, hours in use, standby hours, site location, and work type. The input fields for the labor will contain manpower, hours and work type. The submittal table will consist of the submitters' names and the weather for that day. All four data tables will be linked using the project number and contract number. This module can be run as a standalone module by the inspector's laptop to connect to a dial-up server. Once the dial-up

server connection is established, the send/receive menu allows for uploads and downloads of selected projects.

The daily field reports module 118 can communicate with a monthly estimate report module 122. This module is also an output module that will basically combined the totals from the daily field reports for each month at the project cutoff date and print a report. The report will consist of each item for the project along with its unit, planned quantity for the entire project, quantity used for the month and quantity used for the entire project through the cutoff date. These items will queried from the daily field report tables monthly. The report will also contain the unit price, total amount spent for each item and cumulative total for all items. The unit price information is defined in the new contract information table and this table will be linked to that table using the contract and project number. The equation to determine the total amount spent on each item to date and cumulative totals are depicted in equation 4 and 5 respectively.

$$\text{(Equation 4) Item Total Amount to Date} = \sum(\text{Quantity_Actual}) * \text{Unit Price}$$

$$\text{(Equation 5) Item Cumulative Totals} = \text{Cumul_QTY} * \text{Unit Price}$$

A print function will be needed in this module to print out the daily posting report in MS Word format in which the necessary data will be inputted into a defined template.

The monthly estimate report module 122 in turn communicates with a document closure module 130. This module function is to develop all the closure documents that are required for project completion. Individual templates will be created for each document. The appropriate tables for each document will queried to fill out each template. The

templates will be created in MS Word format. The closure document templates that will need to be created are listed below.

- Final Payment Certificate
- Change Orders
- Consent of Surety Letter from Contractor
- Contractors Certificate of Final Completion
- Copy of Approved Council Motion
- Affidavit of Work Performed

Each user of the software package will have their own user-defined documents or forms. These documents are user configurable by updating or adding new templates can be created using MS Word depending on the company's requirements without requiring a software source code change.

The daily field reports modules 118 can communicate with a change order module 120 in the event changes are required. If so, the change order module 120 communicates with the unit bit price 114 and the new contract module 112. The requirements for this module are to allow changes to be made to the initial contract. The module will be linked to the new contract table and allow the user to make a change to the original contract. A change order has to go through certain before it is approved. This module will generate the proper documents needed for the change order such as the request for information (RFI), request for proposal (RFP), and the actual change order document. The change order tables will be linked by contract number to extract the appropriate contract information needed for the forms. The change order table will also need to be linked to previous change order (CO) tables to allow the user to know what previous changes have been made to the contract. The fields that will be inputted into the change order tables are the amount and duration of the